U.S. Department of Commerce
National Institute of Standards and Technology
Gaithersburg, MD 20899-2350

Certificate Number: 98-053A2

National Type Evaluation Program

Certificate of Conformance

for Weighing and Measuring Devices

For:

Jewelers/Grain Scale
Digital Electronic
Models: EXXXX2 and VXXXX2*
Capacity: 210 g to 8100 g

Accuracy Class: II

Submitted by:

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Standard Features and Options

***** See Page 2 for specific models and capacities**.**

Automatic zero setting mechanism (AZSM)
Initial zero setting mechanism (IZSM)
Semi-automatic zero
"The Counting Feature is Not Legal for Trade" is labeled on the front of the scale
Cross-hatching of the display is used to identify "d" when it is not equal to "e" (d < e)
Liquid crystal display (LCD) - Explorer
LCD with a multi-graphic display** - Voyager

** For non-metrological features such as storing and displaying statistical data and good laboratory practices.

Weight Units: (Explorer and Voyager)

kilogram	troy ounce	gram	grain	carat
pound	pennyweight	ounce	milligram	newton

Options: Automatic calibration (internal calibration mass) (see Operation on Page 3)
RS232 interface capability
Print capability

Temperature Range: 10 °C to 30 °C (50 °F to 86 °F)

This device was evaluated under the National Type Evaluation Program (NTEP) and was found to comply with the applicable technical requirements of Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices." Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages.

Effective Date: February 15, 2000

Gilbert M. Ugiansky, Ph.D.
Chief, Office of Weights and Measures
Issue Date: March 16, 2000

Ohaus Corporation
Jewelers/Grain Scale
Models: EXXXX2 and VXXXX2

Specific Models and Device Specification: **E = Explorer and V = Voyager**

Models	Platform Size	Capacity	e	d[1]	n_{max}
E12132 w/internal calibration E02132 V12132 w/internal calibration V02132	12 cm diameter	210 g	10 mg	1 mg	21 000
E14132 w/internal calibration E04132 V14132 w/internal calibration V04132	12 cm diameter	410 g	10 mg	1 mg	41 000
E1RV72 w/internal calibration[2] E0RV72 [2] V1RV72 w/internal calibration[2] V0RV72 [2]	12 cm diameter	0 g to 100 g x 10 mg 100 g to 410 g x 10 mg		1 mg 10 mg	41 000
E15132 w/internal calibration E05132 V15132 w/internal calibration V05132	12 cm diameter	510 g	10 mg	1 mg	51 000
E16122 w/internal calibration E06122 V16122 w/internal calibration V06122	17.2 cm x 17.2 cm	610 g	100 mg	10 mg	6100
E1B122 w/internal calibration E0B122 V1B122 w/internal calibration V0B122	17.2 cm x 17.2 cm	2100 g	100 mg	10 mg	21 000
E1RW62 w/internal calibration[2] E0RW62 [2] V1RW62 w/internal calibration[2] V0RW62 [2]	17.2 cm x 17.2 cm	0 g to 1000 g x 100 mg 1000 g to 4100 g x 100 mg		10 mg 100 mg	41 000
E1D122 w/internal calibration E0D122 V1D122 w/internal calibration V0D122	17.2 cm x 17.2 cm	4100 g	100 mg	10 mg	41 000
E1D112 w/internal calibration E0D112 V1D112 w/internal calibration V0D112	17.2 cm x 17.2 cm 20.3 cm x 20.3 cm 17.2 cm x 17.2 cm 20.3 cm x 20.3 cm	4100 g	100 mg	100 mg	41 000
E0E122	17.2 cm x 17.2 cm	5100 g 11 lb	1.0 g 0.001 lb	1.0 g 0.001 lb	11 000
E1F122 w/internal calibration E0F122 V1F122 w/internal calibration V0F122	17.2 cm x 17.2 cm	6100 g	100 mg	10 mg	61 000
E1F112 w/internal calibration E0F112 V1F112 w/internal calibration V0F112	17.2 cm x 17.2 cm 20.3 cm x 20.3 cm 17.2 cm x 17.2 cm 20.3 cm x 20.3 cm	6100 g	100 mg	100 mg	61 000

[1] The display uses cross-hatching to identify when "d" is not equal to "e"
[2] Multi-interval scale

Ohaus Corporation
Jewelers/Grain Scale
Models: EXXXX2 and VXXXX2

Specific Models and Device Specification: (Continued)

Models	Platform Size	Capacity	e	d[1]	n_{max}
E1H122 w/internal calibration E0H122 V1H122 w/internal calibration V0H122	17.2 cm x 17.2 cm	8100 g	100 mg	10 mg	81 000
E1H112 w/internal calibration E0H112 V1H112 w/internal calibration V0H112	17.2 cm x 17.2 cm 20.3 cm x 20.3 cm 17.2 cm x 17.2 cm 20.3 cm x 20.3 cm	8100 g	100 mg	100 mg	81 000
EGD112 *	20.3 cm x 20.3 cm	4100 g	100 mg	N/A	41 000
ECD112 *	20.3 cm x 20.3 cm	4100 g	100 mg	N/A	41 000

[1] The display uses cross-hatching to identify when "d" is not equal to "e"
* Built-in capability to perform bushel weight calculations

Application: General purpose weighing, weighing of grain, and weighing of semi-precious gems and precious metals where the minimum load exceeds 20d.

Grain Inspection Packers and Stockyards Administration (GIPSA formerly FGIS) has three categories of electronic laboratory scales used as grain test scales for official weighing: Precision, Moisture, and General. The models listed below are suitable for the official weighing of grain in GIPSA applications (see Pages 2 and 3 for specific model parameters).

Precision or Moisture		Moisture or General	
EGD112	(Built-in capability to perform bushel weight calculation)	E1D112	V1D112
		E0D112	V0D112
E12132	V12132	E1H112	V1H112
E02132	V02132	E0H112	V0H112
E14132	V14132	E1F112	V1F112
E04132	V04132	E0F112	V0F112
E1RV72	V1RV72	E0E122	
E0RV72	V0RV72		
E15132	V15132		
E05132	V05132		

Identification: The identification badge is located on the left side of the scale.

Sealing: The scale may be sealed with a wire security seal through a tab on a metal plate and a drilled head bolt. This prevents undetected access to the calibration switch inside. The sealing plate and bolt are located under the scale platter. On scales with the 12 cm platter, a metal plate secured by a screw must be removed to access the sealing plate and bolt underneath. The calibration switch must be in the off position before sealing the device. To verify the position of the calibration switch, Explorer models will display the word "Locked" when attempting to calibrate the device. On Voyager models, the messages "LFT ON" (Legal for Trade) and "Cal Safe" are displayed during power up.

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Jewelers/Grain Scale
Models: EXXXX2 and VXXXX2

Operation: The automatic calibration feature uses an internal mass in the balance for calibration and is done automatically when selected.

Test Conditions: This Certificate supersedes Certificate of Conformance Number 98-053A1 and is issued without additional testing to include 610-g capacity to the Models E06122, E16122, V06122 and V16122. These models are identical in design and construction to the 2100-g, 4100-g, and 5100-g models previously listed on the Certificate. The 610-g models are produced from the same 5-kg generic scale assembly used to produce the 2100-g through 5100-g models. All models produced from the 5-kg generic scale assembly have a value of e = 0.1 g. Previous test conditions are listed below for reference.

Certificate of Conformance Number 98-053A1: This Certificate superseded Certificate of Conformance Number 98-053 and was issued to include the Models EGD112 and ECD112 with grain weighing calculation features. The Models EGD112 and ECD112 (4100-g capacity) balances were submitted for evaluation. The emphasis of the evaluation was on device design, operation, print format, and the ability to calculate and display percentage values when weighing grain. No additional testing was performed since the scales are identical to the previously evaluated Explorer and Voyager balances. Additionally, the previously evaluated devices were evaluated to determine the models suitable for weighing grain in GIPSA Precision, Moisture, or General classifications.

Certificate of Conformance Number 98-053: The emphasis of the evaluation was on device design, operation, marking, print format, and compliance with influence factor requirements. The Models E1H112 (8100-g capacity) and V14132 (410-g capacity) balances were submitted for evaluation and tested over a temperature range of 10 °C to 30 °C (50 °F to 86 °F). The devices were also tested for accuracy over a voltage range of 100 VAC to 130 VAC. A load of approximately one-half capacity was applied to each scale over 100 000 times. The scales were tested periodically during this time.

The results of the evaluations and information provided by the manufacturer indicate the devices comply with applicable requirements.

Type Evaluation Criteria Used: NIST Handbook 44, 2000 Edition

Tested By: G. Castro (CA) 98-053 & 98-053A1

Information Reviewed By: G. Newrock (NIST) and R. Suiter (NIST) 98-053A2